

SUPPORT FOR THE AMENDMENT

Support for the amendment to claim 1 is found in claim 9 as originally presented. No new matter would be added to this application by entry of this amendment.

Upon entry of this amendment, claims 1-8, 10-12 and 17-19 will now be active in this application.

### REQUEST FOR RECONSIDERATION

The claimed invention is directed to a process for producing closed-celled rigid polyurethane foams as well as to a graft polyol which may be used to produce closed-celled rigid polyurethane foams.

Rigid polyurethane foams having a closed-cell structure are known for thermal insulation. Reduced molding times and good mold flow properties are still sought in closed-celled rigid polyurethane foam producing processes.

The claimed invention addresses this problem by providing a process for preparing rigid closed-cell polyurethane foam comprising reacting polyisocyanate with a compound having at least two reactive hydrogen atoms in the presence of catalyst and a blowing agent, wherein the compound having at least two hydrogen atoms comprises at least one graft polyol having a hydroxyl value of from 100 to 800 mg KOH/g. Applicants have discovered that such a graft polyol provides for good properties in the process for producing a closed-celled rigid polyurethane foam and is able to provide for crosslinking densities of the polyurethane network, which are higher than when using graft polyols based on flexible foam carrier polyols (pg 6, lines 33-35 of applicants' specification) . Such a process is nowhere disclosed or suggested in the cited art of record.

The rejections of claims 6-11 under 35 U.S.C. §103(a) in view of Haider et al U.S. 2004/0014828, in view of Matsumoto et al U.S. 6,117,937 in view of EP 786,480 is respectfully traversed.

None of the cited art of record discloses or suggests the claimed process of producing a **closed-cell** rigid polyurethane foam with a graft polyol having a hydroxyl number of from 100 to 800 mg KOH/g.

Haider et al. describes a water-blown rigid polyurethane in which the polyol mixture comprises i) at least one polymer polyol, ii) at least one polyol having a hydroxyl number of

from about 200 to about 800, and iii) optionally at least one polyol having a hydroxyl number ranging from about 25 to about 115 (see abstract). Polymer polyols are described in paragraph [0011] as including PHD polymer polyols and SAN polymer polyols.

The SAN polymer polyols are described in paragraph [0012] as prepared by *in situ* polymerization of vinyl monomers with a polyol such as a polyether polyol. Paragraph [0013] describes the hydroxyl number of the SAN polyol as **from 15 to about 50**, preferably about 20 to about 30.

The PHD polymer polyol is described in paragraphs [0015]-[0017] as prepared by *in situ* polymerization of an isocyanate mixture with a diamine and/or hydrazine in a polyol and typically having a hydroxyl value of from **about 15 to about 40**, preferably from about 25 to about 35 (paragraph[0017]). Thus, the polymer polyol components are described as having a low hydroxyl number ranging from about 15 to about 50. There is no suggestion of a graft polyol component having a hydroxyl number of from 100 to 800 mg KOH/g.

In contrast, the claimed invention is directed to a process for producing closed-celled rigid polyurethane foams by reacting a graft polyol having a hydroxyl number of from 100 to 800 mg KOH/g. Applicants note that the claims have been amended to recite **a hydroxyl number of from 100 to 800 mg KOH/g**. As the cited reference only discloses a hydroxyl value of from 15 to about 50, a graft polyol having a hydroxyl value of form 100 to 800 mg KOH/g would simply not have been obvious. The claimed invention is clearly not rendered obvious from this reference.

The basic deficiency of the primary reference is not cured by either of the secondary references, as neither describes a graft polyol having a hydroxyl number of from 100 to 800 mg KOH/g in the preparation of a closed-cell rigid polyurethane.

Mastsumoto et al has been cited for a disclosure of a polymer polyol having a of 10 to 600 mg KOH/g (paragraph column 4, lines 37-41). However, the reference is directed to

preparation of flexible polyurethane foam (column 1, lines 23-26) and not to a closed cell rigid polyurethane foam. Examples 1-23 all were assessed to have a SM level of closed cell content. As a polyol for flexible polyurethane foam, one of ordinary skill in the art would not be motivated to use such a polyol to prepare the closed cell rigid polyurethane of Haider et al. While the official action suggests motivation to use the polyol of Matsumoto et al. in the Haider et al. polyurethane in order to impart a compression and durability enhancing effect, such analysis ignores the fundamental differences between the polyurethane materials being prepared as closed cell rigid v. open cell flexible. Accordingly the combination of references fails to render the claimed invention obvious.

EP 786,480 merely describes the preparation of a polymer polyol which may be used in the generic production of polyurethane articles such as a polyurethane foam, but there is no disclosure or suggestion of a graft polyol having a hydroxyl number of from 100 to 800 in the preparation of a closed-celled rigid polyurethane foam. The reference was merely cited for a disclosure of particle size.

As the cited combination of references fails to disclose or suggest the claimed process in which a graft polyol having a hydroxyl content of 100 to 800 mg KOH/g in the preparation of a closed cell rigid polyurethane foam, the claimed invention would not have been obvious and withdrawal of the rejection under 35 U.S.C. §103(a) is respectfully requested.

The rejections of claims 1-8, 12-15 and 17-19 are believed to be moot as the claims have been narrowed in order to pursue the subject matter of previous claim 9, such amendment being made without prejudice to further prosecution of this subject matter in a continuation application.

Applicants submit that this application is now in condition for allowance and early notification of such action is earnestly solicited.

Respectfully submitted,

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